

AREA

CONVERSION

SQUARE INCHES (sq. in.)	SQUARE CENTIMETERS (cm ²)	SQUARE FEET (sq. ft.)	SQUARE METERS (m ²)	SQUARE YARDS (sq. yds.)	SQUARE METERS (m ²)	ACRES (Acre)	HECTARES (ha)	SQUARE MILES (sq. mi.)	SQUARE KILOMETERS (km ²)
0.15500 = 1		1 = 0.09290		1 = 0.8361		1 = 0.4047		1 = 2.5900	
0.31000 = 2		2 = 0.18581		2 = 1.6723		2 = 0.8094		2 = 5.1800	
0.46500 = 3		3 = 0.27871		3 = 2.5084		3 = 1.2141		3 = 7.7700	
0.62000 = 4		4 = 0.37161		4 = 3.3445		4 = 1.6187		4 = 10.3600	
0.77500 = 5		5 = 0.46452		5 = 4.1807		5 = 2.0234		5 = 12.9500	
0.93000 = 6		6 = 0.55742		6 = 5.0168		6 = 2.4281		6 = 15.5400	
1.08500 = 7		7 = 0.65032		7 = 5.8529		7 = 2.8328		7 = 18.1300	
1.24000 = 8		8 = 0.74323		8 = 6.6890		8 = 3.2375		8 = 20.7300	
1.39500 = 9		9 = 0.83613		9 = 7.5252		9 = 3.6422		9 = 23.3100	
		10.764 = 1				2.471 = 1			
		21.528 = 2		1.1960 = 1		4.942 = 2		0.3861 = 1	
		32.292 = 3		2.3920 = 2		7.413 = 3		0.7722 = 2	
		43.055 = 4		3.5880 = 3		9.884 = 4		1.1583 = 3	
		53.819 = 5		4.7839 = 4		12.355 = 5		1.5444 = 4	
		64.583 = 6		5.9799 = 5		14.826 = 6		1.9305 = 5	
		75.347 = 7		7.1759 = 6		17.297 = 7		2.3166 = 6	
		86.111 = 8		8.3719 = 7		19.768 = 8		2.7027 = 7	
		96.875 = 9		9.5679 = 8		22.239 = 9		3.0888 = 8	
		9 = 58.065		10.7639 = 9				3.4749 = 9	

UNITS OF AREA

UNITS	SQUARE INCHES	SQUARE LINKS	SQUARE FEET	SQUARE YARDS	SQUARE RODS	SQUARE CHAINS
1 sq. in. = 1	0.0159423	0.006944	0.000772	0.000036	0.000001594	
1 sq. link = 62.7264	1	0.4356	0.0484	0.0016	0.0001	
1 sq. ft. = 144	2.295684	1	0.111111	0.00367309	0.000329568	
1 sq. yd. = 1296	20.6612	9	1	0.03305785	0.00206612	
1 sq. rod = 39,204	625	272.25	30.25	1	0.0625	
1 sq. chain = 627.264	10,000	4356	484	16	1	
1 acre = 6272.640	100,000	43560	4840	160	10	
1 sq. mi. = 4,014,489,600	640000000	27,878,400	3097600	102400	6400	
1 sq. cm. = 0.15499969	0.00247104	0.001076	0.000119599	0.000003954	0.000000347	
1 m ² = 1549.9969	24.7104	10.76387	1.195985	0.0395367	0.00247104	
1 hectare	15499.969	247104	107638.7	11959.85	395.367	24.7104

UNITS OF AREA

CONVERSION

UNITS	ACRES	SQUARE MILES	SQUARE CENTIMETERS	SQUARE METERS	HECTARES	
1 Sq. mi =	640	0.000 000 159 423	0.300 000 000 219	6.451 626	0.700 695 1630	0.000 000 065
1 Sq. link =	0.000 01	0.000 000 015 625	404.6873	0.040 468 73	0.000 004 047	NOTE. NUMBERS UNDER-LINED IN GREEN ARE EXACT
1 Sq. ft. =	0.000 022 956 8	0.000 000 035 870 1	929.0341	0.092 903 410	0.000 009 290	3. BY ACT OF CONGRESS July 28, 1866 —
1 Sq. yd =	0.000 206 612	0.000 000 322 831	8361.307	0.836 1307	0.000 083 613	1 yd (U.S.) = <u>3600</u> m. 3937
1 Sq. rod =	0.006 25	0.000 009 765 625	252929.5	25.292 95	0.002 529 295	3. LITER IS VOLUME OF 1 KG OF H ₂ O AT TEMP OF MAX. DENSITY
1 Sq. cm =	0.1	0.000 156 25	4046873	404.6873	0.040 4687	4. STANDARD ATMOSPHERE PRESSURE
1 ACRE	1	0.001 562 5	40468726	4046.873	0.404 687	1 kg = 1000.038 cm ³
1 Sq. mi =	640	1	25 899 984 703 2.589 998	258.9998		4. 1 METER =
1 Sq. cm =	0.000 000 024 7100	0.000 000 000 38610 1		0.0001	0.000 000 001	1553154.13
1 Sq. m =	0.000 247 104	0.000 000 386100.6	10,000	1	0.0001	WAVE LENGTHS OF RED CADMIUM LIGHT UNDER SPECIFIED CONDITIONS OF TEMP., PRESSURE, AND HUMIDITY.
1 hectare	2.471 04	0.003 861 006	100 000 000	10,000	1	THIS CORRESPONDS TO A WAVE LENGTH (CADMIUM RED) OF 6438.469 6 X 10 ⁻⁷ MILLIMETERS

VOLUME

CONVERSION

CUBIC INCHES (cu. in.)	CUBIC CENTIMETERS (cm ³)	CUBIC FEET (cu ft.)	CUBIC METERS (m ³)	CUBIC YARDS (cu. yd.)	CUBIC METERS m ³	CUBIC INCHES (cu. in.)	LITERS (liter)	CUBIC FEET (cu ft.)	LITERS (liter)
1 = 16.3872		1 = 0.028317		1 = 0.7646		1 = 0.0163867		1 = 28.316	
2 = 32.7743		2 = 0.056634		2 = 1.5291		2 = 0.0327934		2 = 56.633	
3 = 49.1615		3 = 0.084951		3 = 2.2937		3 = 0.0491602		3 = 84.949	
4 = 65.5486		4 = 0.113268		4 = 3.0582		4 = 0.0655469		4 = 113.265	
5 = 81.9358		5 = 0.141585		5 = 3.8228		5 = 0.0819336		5 = 141.581	
6 = 98.3230		6 = 0.169902		6 = 4.5874		6 = 0.0983203		6 = 169.898	
7 = 114.7101		7 = 0.198219		7 = 5.3519		7 = 0.1147070		7 = 198.214	
8 = 131.0973		8 = 0.226536		8 = 6.1165		8 = 0.1310938		8 = 226.530	
9 = 147.4845		9 = 0.254853		9 = 6.8810		9 = 0.1474805		9 = 254.846	
0.06102 = 1					61.025 = 1				
0.12205 = 2		35.314 = 1		1.3079 = 1		122.050 = 2		0.035315 = 1	
0.18307 = 3		70.629 = 2		2.6159 = 2		183.075 = 3		0.070631 = 2	
0.34409 = 4		105.943 = 3		3.9238 = 3		344.100 = 4		0.105946 = 3	
0.30512 = 5		141.258 = 4		5.2318 = 4		305.125 = 5		0.141262 = 4	
0.36614 = 6		176.572 = 5		6.5397 = 5		366.150 = 6		0.176577 = 5	
0.42716 = 7		211.887 = 6		7.8477 = 6		427.175 = 7		0.211892 = 6	
0.48819 = 8		247.201 = 7		9.1556 = 7		488.200 = 8		0.247208 = 7	
0.54921 = 9		282.516 = 8		10.4635 = 8		549.225 = 9		0.282523 = 8	
		317.830 = 9		11.7715 = 9		317.839 = 9			

UNITS OF VOLUME

UNITS	CUBIC INCHES	CUBIC FEET	CUBIC YARDS	CUBIC CENTIMETERS	CUBIC DECIMETERS	CUBIC METERS
1 cu. in. =	1	0.000578704	0.000001433	16.387162	0.016387	0.000016387
1 cu. ft. =	1728	1	0.0370370	28317.016	28.317016	0.028317016
1 cu. yd. =	46656	27	1	764559.4	764.5594	0.7645594
1 cc. =	0.06102338	0.000035314	0.000001308	1	0.001	0.000001
1 c. deci. =	61.02338	0.03531445	0.001307943	1000	1	0.001
1 cu. m. =	61023.38	35.31445	1.3079428	1000000	1000	1

CAPACITY - LIQUID MEASURE

CONVERSION

U.S. FLUID DRAMS (fl. dr)	MILLILITERS (ml)	U.S. FLUID OUNCES (fl. oz)	MILLILITERS (ml)	U.S. LIQUID PINTS (pt)	LITERS (liter)	U.S. LIQUID QUARTS (qt.)	LITERS (liter)	U.S. GALLONS (gall)	LITERS (liter)
1 = 3.6966		1 = 29.573		1 = 0.47317		1 = 0.94633		1 = 3.78533	
2 = 7.3932		2 = 59.146		2 = 0.94633		2 = 1.89267		2 = 7.57066	
3 = 11.0898		3 = 88.719		3 = 1.41950		3 = 2.83900		3 = 11.35600	
4 = 14.7865		4 = 118.292		4 = 1.89267		4 = 3.78533		4 = 15.14133	
5 = 18.4831		5 = 147.865		5 = 2.36583		5 = 4.73167		5 = 18.92666	
6 = 22.1797		6 = 177.437		6 = 2.83900		6 = 5.67800		6 = 22.71199	
7 = 25.8763		7 = 207.010		7 = 3.31217		7 = 6.62433		7 = 26.49733	
8 = 29.5729		8 = 236.583		8 = 3.78533		8 = 7.57066		8 = 30.38266	
9 = 33.2695		9 = 266.156		9 = 4.25850		9 = 8.51700		9 = 34.06799	
0.27052 = 1		0.033815 = 1		0.1134 = 1		1.05671 = 1		0.26418 = 1	
0.54104 = 2		0.067629 = 2		0.2268 = 2		2.11342 = 2		0.52836 = 2	
0.81155 = 3		0.101444 = 3		0.3403 = 3		3.17013 = 3		0.79253 = 3	
0.08207 = 4		0.135259 = 4		0.4537 = 4		4.22684 = 4		1.05671 = 4	
1.35259 = 5		0.169074 = 5		0.5671 = 5		5.38355 = 5		1.32089 = 5	
1.62311 = 6		0.202888 = 6		0.6805 = 6		6.34026 = 6		1.58507 = 6	
1.89363 = 7		0.236703 = 7		0.7939 = 7		7.39697 = 7		1.84924 = 7	
2.16414 = 8		0.270518 = 8		0.9074 = 8		8.45368 = 8		2.11342 = 8	
2.43466 = 9		0.304333 = 9		10.0208 = 9		9.51039 = 9		2.37760 = 9	

UNITS OF CAPACITY - LIQUID MEASURE

UNITS	FLUID MINIMS	FLUID DRAMS	FLUID OUNCES	GILLS	LIQUID PINTS	LIQUID GALLONS	LIQUID QUARTS	MILLI-LITERS	LITERS	CUBIC INCHES
1 Minim	1	0.016667	0.002083330.000520833	0.0001303080	0.0000616176	0.0000065104	0.061610	0.000061610	0.003760	
1 fl. dram	60	1	0.125	0.03125	0.0078125	0.000976562	0.003906253.69661	0.00369661	0.225586	
1 fl. oz.	480	8	1	0.25	0.0625	0.0078125	0.03125	29.5739	0.0295739	1.80469
1 gill	1920	32	4	1	0.25	0.03125	0.125	118.293	0.118293	7.21875
1 pt. =	7680	128	16	4	1	0.125	0.5	473.67	0.47367	38.875
1 qt. =	15360	256	32	8	2	0.25	1	946.333	0.946333	57.75
1 gal.	61440	1024	128	32	8	1	4	3785.333	3.785332	231
1 ml. liter	16.2311	0.270518	0.0338147	0.00845368	0.00211342	0.000264175	0.00105671	1	0.001	0.061025
1 liter	16,381.1	270.518	33.8147	8.45368	2.11342	0.264178	1.05671	1000	1	61.0250
1 cu. in.	265.974	4.43290	0.554113	0.138578	0.0346320	0.00432900	0.0173160	16.3867	0.0163867	1

CAPACITY - DRY MEASURE CONVERSION

U.S. dry QUARTS (qt.)	LITERS (liter)	U.S. Pecks (PK)	LITERS	U.S. Pecks (PKs)	Decaliters (dL)	U.S. bushel (bu)	Hectoliters hl.	U.S. bushels per acre	Hectoliters per hectare
1 = 1.1012			1 = 8.810		1 = 0.8810	1 = 0.35238		1 = 0.8708	
3 = 2.3024			3 = 17.619		2 = 1.7619	2 = 0.70477		2 = 1.7415	
3 = 3.3036			3 = 26.429		3 = 2.6429	3 = 1.05715		3 = 2.6123	
4 = 4.4048			4 = 35.238		4 = 3.5238	4 = 1.40953		4 = 3.4830	
5 = 5.5060			5 = 44.048		5 = 4.4048	5 = 1.76192		5 = 4.3538	
6 = 6.6072			6 = 52.857		6 = 5.2857	6 = 2.11430		6 = 5.2295	
7 = 7.7084			7 = 61.667		7 = 6.1667	7 = 2.46668		7 = 6.0953	
8 = 8.8096			8 = 70.477		8 = 7.0477	8 = 2.81907		8 = 6.9660	
9 = 9.9108			9 = 79.286		9 = 7.9286	9 = 3.17145		9 = 7.8368	
0.9081 = 1						2.8378 = 1		114.84 = 1	
1.8162 = 2		0.11351 = 1				5.6756 = 2		2.2969 = 2	
2.7243 = 3		0.22703 = 2				8.5135 = 3		3.4453 = 3	
3.6324 = 4		0.34059 = 3		1.1351 = 1		11.3513 = 4		4.5937 = 4	
4.5405 = 5		0.45405 = 4		2.2703 = 2		14.1891 = 5		5.7421 = 5	
5.4486 = 6		0.56756 = 5		3.4059 = 3		17.0269 = 6		6.8906 = 6	
6.3567 = 7		0.68108 = 6		4.5405 = 4		19.8647 = 7		8.0390 = 7	
7.2648 = 8		0.79459 = 7		5.6756 = 5		22.7026 = 8		9.1874 = 8	
8.1729 = 9		0.90810 = 8		6.8108 = 6		25.5404 = 9		10.3359 = 9	
		1.02161 = 9		7.9459 = 7					
				9.0810 = 8					
				10.2161 = 9					

UNITS OF CAPACITY DRY MEASURE

UNITS	DRY PINTS	DRY QUARTS	PECKS	BUSHELS	LITERS	DEKA LITERS	CUBIC INCHES
1 dry pt.	1	0.5	0.0625	0.015625	0.550599	0.055060	33.6003125
1 dry qt.	2	1	0.125	0.03125	1.101198	0.110120	67.200625
1 peck	16	8	1	0.25	8.80958	0.880958	537.605
1 bushel	64	32	4	1	35.2383	3.52383	2150.42
1 liter	4.81620	0.408102	0.113513	0.029378	1	0.1	61.0250
1 dekaliter	18.1620	9.08102	1.13513	0.28578	10	1	610.250
1 cu. in.	0.029762	0.014881	0.001860	0.000465	0.016387	0.001639	1

MASS

CONVERSION

GRAINS (grains)	GRAMS (g)	APOTHECARIES' GRAMS	GRAMS (de ap a 3)	TROY OUNCES	GRAMS (oz. t.)	GRAMS g	AVOIDUPOIS ounces	AVOIDUPOIS ounces	AVOIDUPOIS GRAMS g	AVOIDUPOIS pounds	Kilograms
1 = 0.064799		1 = 3.8879		1 = 31.103		1 = 28.350		1 = 0.45359			
2 = 0.129598		2 = 7.7759		2 = 62.207		2 = 56.699		2 = 0.90718			
3 = 0.194397		3 = 11.6638		3 = 93.310		3 = 85.049		3 = 1.36078			
4 = 0.259196		4 = 15.5517		4 = 124.414		4 = 113.398		4 = 1.81437			
5 = 0.323995		5 = 19.4397		5 = 155.517		5 = 141.748		5 = 2.26796			
6 = 0.388794		6 = 23.3276		6 = 186.621		6 = 170.097		6 = 2.72155			
7 = 0.453592		7 = 27.2155		7 = 217.724		7 = 198.947		7 = 3.17515			
8 = 0.518391		8 = 31.1035		8 = 248.828		8 = 226.796		8 = 3.62874			
9 = 0.583190		9 = 34.9914		9 = 279.931		9 = 255.146		9 = 4.08233			
15.4324 = 1		0.51441 = 2		0.035274 = 1		2.20462 = 1					
30.8647 = 2		0.77162 = 3		0.070598 = 2		4.40924 = 2					
46.3971 = 3		1.02882 = 4		0.105832 = 3		6.61387 = 3					
61.7394 = 4		1.28603 = 5		0.141096 = 4		8.81849 = 4					
77.1618 = 5		1.54324 = 6		0.176370 = 5		11.02311 = 5					
92.5941 = 6		1.80044 = 7		0.211694 = 6		13.22773 = 6					
108.0265 = 7		2.05765 = 8		0.246918 = 7		15.43236 = 7					
123.4589 = 8		2.31485 = 9		0.282192 = 8		17.63698 = 8					
138.8912 = 9				0.317466 = 9		19.84160 = 9					

UNITS OF MASS LESS THAN POUNDS AND KILOGRAMS

UNITS	GRAINS	apothecaries Scruples	pennyweights	avoirdupois Ounces	apothecaries Ounces	avoirdupois Ounces	apothecaries Ounces
1 grain	1	0.05	0.041666667	0.03657143	0.0166666667	0.00229571	0.00208333
1 apoth. Scr.	30	1	0.833333333	0.7314286	0.333333333	0.0957143	0.09166667
1 pennywt	34	1.2	1	0.8777143	0.4	0.0548571	0.05
1 avo. dram	27.34375	1.3671875	1.139323	1	0.4557292	0.0625	0.056966196
1 ap. dram	60	3	2.5	2.194286	1	0.1371429	0.125
1 av. oz.	437.5	21.875	18.72917	16	7.29167	1	0.9114583
1 apoth. oz.	480	24	30	17.55438 210.6514	8	1.0971429	1
1 apoth. lb	5760	288	240	280.6514	96	13.165714	12
1 av. lb	7000	350	291.66667	256	116.66666667	16	14.583333
1 milligram	0.0154320.000771618	0.000693015	0.000564383	0.000257206	0.000035274	0.000032158	
1 gram	15.4323560.771618	0.64301485	0.564383332	0.25720594	0.03527396	0.032150742	
1 kilogram	15432.3567716178	643.01485	564.38332	257.20594	35.27396	32.150742	

UNITS OF MASS GREATER THAN AVOIRDUPOIS OUNCES

UNITS	avoirdupois ounces	avoirdupois pounds	SHORT HUNDRED WEIGHTS	SHORT TONS	LONG TONS	Kilograms	METRIC TONS
1 avoy	1	0.0625	0.000625	0.00003125	0.000027902	0.02834953	0.00028350
1 arshl	16	1	0.01	0.0005	0.000446428	0.453592427	0.000453592
1 short ton	1000	100	1	0.05	0.04464286	95.359243	0.045359243
1 sh. T.	32000	2000	20	1	0.8928571	907.18486	0.90718486
1 long T.	35840	2240	22.7	1.12	1	1016.04704	1.01604704
1 hds	35.273957	2.20462234	0.022046223	0.001102311	0.000984206	1	0.001
1 maf T.	35873.9572204.62234	22.046223	1.1023112	0.98420670	1000		1

From above table, it is possible to obtain any values by mere addition, provided the decimal point is shifted correctly.

All lengths, areas, & cu. measures in table, based on 1 meter = 39.37-in.

All capacities are based on 1 liter = 1.000038 cubic centimeters. The gallon U.S. is 231 cu in. Bushel, U.S. is 2150.43 cu in. The British gal is 277.420 cu in. and British Bushel is 2,219.36 cu in.

All weights are based on 1 avoirdupois lb = 453.5924277 grams.

UNITS OF MASS LESS THAN POUNDS AND KILOGRAMS CONVER.					
UNITS	apoth. or troy pounds	avoirdupois pounds.	Milligrams	Grams	Kilogrmas
1 grain	0.000173611	0.000142857	64.798918	0.064798918	0.000064798
1 apoth. scrn	0.003473222	0.002857143	1295.9784	1.2959784	0.001295978
1 pennywt.	0.004166667	0.003428571	1555.1740	1.5551740	0.001555174
1 aro. dram	0.004747179	0.00390625	1771.8454	1.7718454	0.001771845
1 apoth. dram	0.010416667	0.008571429	3887.9351	3.8879351	0.003887935
1 avoie. oz.	0.075954801	0.0625	28349.527	28.349527	0.02834953
1 ap. or troy oz.	0.083333333	0.06857143	31103.481	31.103481	0.03110348
1 ap. or troy lb.	1	0.8228571	373241.77	373.24177	0.37324177
1 avoie. lb.	1.2153778	1	453592.4277453	453.5924277	0.453592427
1 milligram	0.000002679	0.00000220462	1	0.001	0.000001
1 gram	0.00267923	0.00220462	1000	1	0.001
1 kilogram	2.6792285	2.204622341	1000000	1000	1

WEIGHT OF WATER.

1 cubic inch = .03617 pounds

12 cubic inches = .434 pounds

1 cubic foot = 62.5 pounds.

1 cubic foot = 7.48052 U.S. gals.

1.8 cu ft. = 112.0 pounds

35.34 cu ft = 2240.0 pounds

1 cylindrical inch = .02847 lbs.

12 cylindrical inches = .341 lbs.

1 cylindrical foot = 49.10 lbs.

1 cylindrical foot = 6.0 U.S. gals.

2.282 cylindrical feet = 112.0 lbs.

45.64 cylindrical feet = 2240.0 lbs.

1 imperial gal = 10.0 lbs.

11.2 imperial gals = 112.0 pounds

224 imperial gals = 2240.0 pounds

1. U.S. gals = 8.355 pounds

13.44 U.S. gals = 112.0 pounds

268.8 U.S. gals = 2240.0 pounds.

COMPARISON OF TONS AND POUNDS IN U.S.						
TROY LBS AND POUNDS LBS	KILOGRAMS	SHORT TONS	LONG TONS	METRIC TONS		
1 4.822857	0.37324	0.0004943	0.00036735	0.00037324		
2 1.64571	0.74648	0.00082286	0.00073469	0.00074649		
3 2.46857	1.11973	0.00123429	0.00110204	0.00111973		
4 3.29143	1.49297	0.00169571	0.00146939	0.00147297		
5 4.11429	1.86621	0.00205714	0.00183673	0.00186621		
6 4.93714	2.23945	0.002476857	0.00220408	0.00223945		
7 5.76000	2.61269	0.002880000	0.00257143	0.00261269		
8 6.58276	2.98593	0.00329143	0.00293879	0.00298593		
9 7.40571	3.35918	0.00370286	0.00330612	0.00335918		
10 8.22857	3.73242	0.0040943	0.0037324	0.00378593		
11 9.05143	4.10571	0.0044778	0.00413379	0.00418607		
12 9.87429	4.47907	0.0048612	0.00453571	0.00458359		
13 10.70143	4.85241	0.0052446	0.00490718	0.00496718		
14 11.52523	5.22575	0.0056281	0.00529729	0.00535718		
15 12.34803	5.59908	0.0060115	0.00587143	0.00593607		
16 13.17183	5.97242	0.0063940	0.00604574	0.00610747		
17 14.00563	6.34576	0.0067763	0.00642783	0.00648733		
18 14.82943	6.71909	0.0071587	0.00682914	0.00689733		
19 15.65323	7.09243	0.0075412	0.00720045	0.00726742		
20 16.47703	7.46576	0.0079237	0.00756974	0.00763674		
21 17.30083	7.83909	0.0083062	0.00792879	0.00799579		
22 18.12463	8.21243	0.0086887	0.00825944	0.00832744		
23 18.94843	8.58576	0.0090712	0.00863075	0.00870075		
24 19.77223	8.95909	0.0094537	0.00900145	0.00907145		
25 20.60603	9.33242	0.0098362	0.00937231	0.00944031		
26 21.42983	9.70575	0.0102187	0.00984471	0.00991271		
27 22.25363	10.07909	0.0105913	0.01001273	0.01008073		
28 23.07743	10.45243	0.0109738	0.01058973	0.01065773		
29 23.90123	10.82576	0.0113563	0.01090773	0.01097573		
30 24.72503	11.19909	0.0117388	0.01143573	0.01150373		
31 25.54883	11.57243	0.0121213	0.01174273	0.01181073		
32 26.37263	11.94576	0.0124938	0.01214973	0.01221773		
33 27.19643	12.31909	0.0128763	0.01256673	0.01263473		
34 27.92023	12.69243	0.0132588	0.01294373	0.01301173		
35 28.74403	13.06576	0.0136413	0.01332073	0.01338873		
36 29.56783	13.43909	0.0140238	0.01360773	0.01367573		
37 30.39163	13.81243	0.0144063	0.01409473	0.01416273		
38 31.21543	14.18576	0.0147888	0.01448173	0.01454973		
39 31.93923	14.55909	0.0151713	0.01506873	0.01513673		
40 32.76303	14.93243	0.0155538	0.01535573	0.01542373		
41 33.58683	15.30576	0.0159363	0.01574273	0.01581073		
42 34.41063	15.67909	0.0163188	0.01614973	0.01621773		
43 35.23443	16.05243	0.0166913	0.01650673	0.01657473		
44 36.05823	16.42576	0.0170738	0.01689373	0.01696173		
45 36.88203	16.79909	0.0174563	0.01728073	0.01734873		
46 37.70583	17.17243	0.0178388	0.01764773	0.01771573		
47 38.52963	17.54576	0.0182213	0.01804673	0.01811473		
48 39.35343	17.91909	0.0186038	0.01842573	0.01849373		
49 39.97723	18.29243	0.0189863	0.01880473	0.01887273		
50 40.80103	18.66576	0.0193688	0.01918373	0.01925173		
51 41.62483	19.03909	0.0197513	0.01956873	0.01963673		
52 42.44863	19.41243	0.0201338	0.01998373	0.02005173		
53 43.27243	19.78576	0.0205163	0.02033073	0.02040873		
54 44.09623	20.15909	0.0208988	0.02073773	0.02080573		
55 44.92003	20.53243	0.0212813	0.02114673	0.02121473		
56 45.74383	20.90576	0.0216638	0.02152373	0.02159173		
57 46.56763	21.27909	0.0220463	0.02190273	0.02196973		
58 47.39143	21.65243	0.0224288	0.02228173	0.02234973		
59 48.21523	22.02576	0.0228113	0.02263873	0.02270673		
60 49.03903	22.39909	0.0231938	0.02296573	0.02303373		
61 49.86283	22.77243	0.0235763	0.02340273	0.02347073		
62 50.68663	23.14576	0.0239588	0.02373973	0.02380773		
63 51.51043	23.51909	0.0243413	0.02412073	0.02418873		
64 52.33423	23.89243	0.0247238	0.02450173	0.02456973		
65 53.15803	24.26576	0.0251063	0.02487273	0.02494073		
66 53.98183	24.63909	0.0254888	0.02524373	0.02531173		
67 54.80563	25.01243	0.0258713	0.02561473	0.02568273		
68 55.62943	25.38576	0.0262538	0.02600573	0.02607373		
69 56.45323	25.75909	0.0266363	0.02635673	0.02642473		
70 57.27703	26.13243	0.0270188	0.02670773	0.02677573		
71 58.10083	26.50576	0.0273913	0.02704873	0.02711673		
72 58.92463	26.87909	0.0277738	0.02743973	0.02750773		
73 59.74843	27.25243	0.0281563	0.02780073	0.02786873		
74 60.57223	27.62576	0.0285388	0.02814173	0.02820973		
75 61.39603	28.00909	0.0289213	0.02850273	0.02857073		
76 62.21983	28.38243	0.0293038	0.02883373	0.02889173		
77 63.04363	28.75576	0.0296863	0.02916473	0.02923273		
78 63.86743	29.12909	0.0300688	0.02948573	0.02955373		
79 64.69123	29.50243	0.0304513	0.02976673	0.02983473		
80 65.51503	29.87576	0.0308338	0.03004773	0.03011573		
81 66.33883	30.24909	0.0312163	0.03032873	0.03039673		
82 67.16263	30.62243	0.0315988	0.03060973	0.03067773		
83 67.98643	31.00000	0.0319813	0.03088073	0.03094873		
84 68.81023	31.37343	0.0323638	0.03116173	0.03122973		
85 69.63403	31.74676	0.0327463	0.03144273	0.03151073		
86 70.45783	32.12009	0.0331288	0.03172373	0.03179173		
87 71.28163	32.49343	0.0335113	0.03200473	0.03207273		
88 72.10543	32.86676	0.0338938	0.03228573	0.03235373		
89 72.92923	33.24009	0.0342763	0.03256673	0.03263473		
90 73.75303	33.61343	0.0346588	0.03284773	0.03291573		
91 74.57683	33.98676	0.0350413	0.03312873	0.03319673		
92 75.40063	34.36009	0.0354238	0.03340973	0.03347773		
93 76.22443	34.73343	0.0358063	0.03369073	0.03375873		
94 77.04823	35.10676	0.0361888	0.03407173	0.03413973		
95 77.87203	35.48009	0.0365713	0.03435273	0.03442073		
96 78.69583	35.85343	0.0369538	0.03463373	0.03470173		
97 79.51963	36.22676	0.0373363	0.03491473	0.03498273		
98 80.34343	36.60009	0.0377188	0.03519573	0.03526373		
99 81.16723	36.97343	0.0380913	0.03547673	0.03554473		
100 81.99103	37.34676	0.0384738	0.03575773	0.03582573		
101 82.81483	37.72009	0.0388563	0.03603873	0.03610673		
102 83.63863	38.09343	0.0392388	0.03631973	0.03638773		
103 84.46243	38.46676	0.0396213	0.03660073	0.03666873		
104 85.28623	38.84009	0.0400038	0.03688173	0.03694973		
105 86.11003	39.21343	0.0403863	0.03716273	0.03723073		
106 86.93383	39.58676	0.0407688	0.03744373	0.03751173		
107 87.75763	39.96009	0.0411513	0.03772473	0.03779273		
108 88.58143	40.33343	0.0415338	0.03800573	0.03807373		
109 89.40523	40.70676	0.0419163	0.03828673	0.03835473		
110 90.22903	41.08009	0.0422988	0.03856773	0.03863573		
111 91.05283	41.45343	0.0426813	0.03884873	0.03891673		
112 91.87663	41.82676	0.0430638	0.03912973	0.03919773		
113 92.70043	42.19909	0.0434463	0.03941073	0.03947873		
114 93.52423	42.57243	0.0438288	0.03969173	0.03975973		
115 94.34803	42.94576	0.0442113	0.04007273	0.04014073		
116 95.17183	43.31909	0.0445938	0.04035373	0.04042173		
117 95.99563	43.69243	0.0449763	0.04063473	0.04070273		
118 96.81943	44.06576	0.0453588	0.04091573	0.04098373		
119 97.64323	44.43909	0.0457413	0.04119673	0.04126473		
120 98.46703	44.81243	0.0461238	0.04147773	0.04154573		
121 99.29083	45.18576	0.0465063	0.04175873	0.04182673		
122 100.11463	45.55909	0.0468888	0.04203973	0.04210873		
123 100.93843	45.93243	0.0472713	0.04232073	0.04238973		
124 101.76223	46.30576	0.0476538	0.04260173	0.04267073		
125 102.58603	46.67909	0.0480363	0.04288273	0.04295173		
126 103.40983	47.05243	0.0484188	0.04316373	0.04323273		
127 104.23363	47.42576	0.0487913	0.04344473	0.04351373		
128 105.05743	47.79909	0.0491738	0.04372573	0.04379473		
129 105.88123	48.17243	0.0495563	0.04400673	0.04407573		
130 106.70503	48.54576	0.0499388	0.04428773	0.04435673		
131 107.52883	48.91909	0.0503213	0.04456873	0.04463773		
132 108.35263	49.29243	0.0507038	0.04484973	0.04491873		
133 109.17643	49.66576	0.0510863	0.04513073	0.04520973		
134 110.00023	50.03909	0.0514688	0.04541173	0.04548073		
135 110.82403	50.41243	0.0518513	0.04569273	0.04576173		
136 111.64783	50.78576	0.0522338	0.04607373	0.04614273		
137 112.47163	51.15909	0.0526163	0.04635473	0.04642373		
138 113.29543	51.53243	0.0530988	0.04663573	0.04670473		
139 114.11923	51.90576	0.0534813	0.04691673	0.04698573		
140 114.94303	52.27909	0.0538638	0.04719773	0.04726673		
141 115.76683</						